

IN THE CLAIMS

Please replace all prior versions of the claims with the following claim set:

1. (currently amended) A method of forming a foam, the method comprising reacting at least one sulfonyl hydrazide chemical blowing agent with at least one curing agent to form the foam, wherein the curing agent reacts with the blowing agent at a temperature below an the activation temperature of the blowing agent,

wherein the curing agent is a waterborne epoxy adduct of a polyamine, a polyamide or a polyamide-amine.

2. (cancelled)

3. (withdrawn) The method of claim 2 wherein the curing agent comprises an adduct of a transaminated Mannich base.

4. (original) The method of claim 2 wherein the curing agent comprises an emulsion of an epoxy adduct of a polyamine.

5. (withdrawn) The method of claim 4 wherein the epoxy adduct comprises an epichlorhydrin adduct.

6. (original) The method of claim 4 wherein the curing agent comprises an emulsion of an epoxy adduct of a polyamide-amine.

7. (currently amended) The method of claim 2 1, wherein the curing agent comprises an emulsion of an epoxy adduct, the epoxy adduct being the reaction product of a poly (alkylene oxide) momoamine or diamine and a di or polyepoxide, which is then reacted with a polyamine or a polyamide, or the reaction product of a poly(alkylene oxide) monoalcohol and a polyepoxide, which is then reacted with a polyamine or a polyamide.

8. (original) The method of any of claims 1-7 wherein reacting the at least one sulfonyl hydrazide chemical blowing agent with the at least one curing agent is carried out in the presence of a binder, the binder forming the foam with the blowing agent and the curing agent.

9. (original) The method of claim 8 wherein the binder comprises a resin.

10. (original) The method of claim 9 wherein the resin comprises an epoxy-based resin, the curing agent cross-linking the epoxy-based resin.

11. (original) The method of claim 10 wherein the epoxy-based resin comprises an epoxy-terminated polysulfide.

12. (original) The method of claim 8 wherein the binder comprises a latex.

13. (original) The method of any of claims 8-12 wherein the sulfonyl hydrazide blowing agent comprises about 0.01% to about 15% by weight of the sum of the weights of the blowing agent, the curing agent, and the binder.

14. (original) The method of any of claims 8-13 wherein the curing agent comprises about 30% to about 70.0% by weight of the sum of the weights of the blowing agent, the curing agent, and the binder.

15. (original) The method of claim 1 wherein the sulfonyl hydrazide blowing agent comprises about 0.01% to about 15% of the foam by weight.

16. (original) The method of claim 15 wherein the sulfonyl hydrazide blowing agent comprises about 1% to about 10% of the foam by weight.

17. (original) The method of any of claims 1-16 further comprising introducing at least one fire retardant into the foam.

18. (withdrawn) The method of claim 17 wherein the fire retardant is selected from the group consisting of phosphates, endothermic fillers, char forming agents, tris(hydroxyethyl)isocyanurates, and polyfunctional alcohols.

19. (withdrawn) The method of claim 1 further comprising reacting at least one epoxy-based resin with the curing agent.

20. (original) The method of claim 8 wherein the epoxy-based resin is a bisphenol A type epoxy resin.

21. (withdrawn) The method of claim 8 wherein the epoxy-based resin is a bisphenol F type epoxy resin.

22. (withdrawn) The method of any of claims 1-21 wherein the at least one chemical blowing agent is p-toluenesulfonylhydrazide.

23. (withdrawn) The method of any of claims 1-21 wherein the at least one chemical blowing agent is p,p'-oxybis(benzenesulfonylhydrazide).

24. (original) The method of any of claims 1-23 further comprising introducing at least one low-density filler into the epoxy-based foam.

25. (withdrawn and currently amended) A method of forming an epoxy-based foam, the method comprising reacting a sulfonyl hydrazide with at least one curing agent, and at least one epoxy-based resin at a temperature between about 1° C. and about 60° C. to form the epoxy-based foam,

wherein the curing agent is a waterborne epoxy adduct of a polyamine, a polyamide or a polyamide-amine.

26. (withdrawn) The method of claim 25 wherein the curing agent is a waterborne polyamine or polyamide.

27. (withdrawn) The method of claim 26 wherein the curing agent is an emulsion of an adduct of a polyamine.

28. (withdrawn) The method of any of claims 25-27 further comprising introducing at least one fire retardant into the epoxy-based foam, wherein the epoxy-based resin is capable of cross-linking with the at least one curing agent.

29. (withdrawn) A foam produced by the method of claim 1.

30. (withdrawn) The foam of claim 29 wherein the foam comprises an epoxy or modified epoxy resin.

31. (withdrawn) The foam of claim 29 or 30 wherein the foam formed in a mold.

32. (withdrawn) The foam of claim 29 or 30 wherein the foam is formed by spraying a two-component mixture onto a substrate.

33. (original) A fire resistant foam produced by the method of claim 17.

34. (withdrawn) The foam of claim 33 wherein the foam comprises an epoxy or modified epoxy resin.

35. (withdrawn) The epoxy-based foam of claim 34 wherein the foam is applied as a protective coating on a substrate.

36. (withdrawn and currently amended) A waterborne foamable resin system comprising a resin, a sulfonyl hydrazide chemical blowing agent, the chemical blowing agent having an activation temperature, and a curing agent, ~~the curing agent comprising an amine or an amide wherein the curing agent is~~ a waterborne epoxy adduct of a polyamine, a polyamide or a polyamide-amine capable of reacting with the blowing agent at a temperature below the activation temperature of the blowing agent to form a foam.

37. (withdrawn) The system of claim 36 wherein the curing agent is capable of cross-linking the resin at room temperature, and the curing agent is capable of reacting with the blowing agent at room temperature.

38. (withdrawn) The system of claim 36 or 37 wherein the curing agent comprises an adduct of a polyamine.

39. (withdrawn) The system of any of claims 36-38 wherein the resin is an epoxy-based resin.

40. (withdrawn) The system of claim 39 wherein the epoxy-based resin is a Bisphenol A type resin or a Bisphenol F type resin.

41. (withdrawn) The system of any of claims 36-40 further comprising at least one fire retardant.

42. (withdrawn) The system of claim 41 wherein the fire retardant is at least one selected from the group consisting of phosphates, endothermic fillers, char forming agents, tris(hydroxyethyl)isocyanurates, and polyfunctional alcohols.

43. (withdrawn) The system of any of claims 36-42 wherein the sulfonyl hydrazide chemical blowing agent comprises about 0.01% to about 15% of the system by weight.

44. (withdrawn) The system claim 43 wherein the sulfonyl hydrazide chemical blowing agent comprises about 1% to about 10% of the system by weight.

45. (withdrawn) The system of any of claims 36-44 wherein the resin comprises about 25% to about 70% of the system by weight.

46. (withdrawn) The system of any of claims 36-45 the curing agent comprises about 30% to about 70% of the system by weight.

47. (withdrawn) A foam produced from the system of any of claims 36-46.

48. (withdrawn) The foam of claim 47 having a density of less than 0.6 g/cm^3 .

49. (withdrawn and currently amended) A foam comprising the reaction product of a sulfonyl hydrazide and a ~~waterborne polyamine or waterborne polyamine~~ curing agent comprising a waterborne epoxy adduct of a polyamine, a polyamide or a polyamide-amine.

50. (withdrawn) The foam of claim 49 wherein the waterborne polyamide is an emulsion of an adduct of a polyamine.

51. (withdrawn) The foam of claim 49 or 50 further comprising at least one low-density filler.

52. (withdrawn and currently amended) A two-part chemical blowing agent comprising a sulfonyl hydrazide and a ~~waterborne emulsion of a polyamine~~ curing agent comprising a waterborne epoxy adduct of a polyamine, a polyamide or a polyamide-amine.

53. (withdrawn and currently amended) A method of forming a polymeric foam comprising reacting a sulfonyl hydrazide and a ~~waterborne polyamine or waterborne polyamide~~ a curing agent comprising a waterborne epoxy adduct of a polyamine, a polyamide or a polyamide-amine at generally ambient temperature and generally ambient pressure.

54. (withdrawn and currently amended) A waterborne curable resin system for producing a fire-resistant cured epoxy-based resin, the system comprising an epoxy-based resin, a sulfonyl hydrazide blowing agent, a curing agent, ~~the curing agent comprising a waterborne emulsion of an adduct of a polyamideamine,~~ comprising a waterborne epoxy adduct of a polyamine, a

polyamide or a polyamide-amine, the curing agent being capable of curing the resin at room temperature, and at least one fire retardant.

55. (withdrawn) The system of claim 54 wherein the fire retardant is selected from the group consisting of phosphates, endothermic fillers, char forming agents, tris(hydroxyethyl)isocyanurates, and polyfunctional alcohols.

56. (original) The system of claim 55 wherein the fire retardant comprises a phosphate.

57. (withdrawn) A cured composition of any of claims 54-56.

58. (withdrawn) A method of protecting a substrate from fire or other hyperthermal conditions, the method comprising applying the composition of claim 57 to the substrate.

59. (withdrawn) A substrate with a coating of the composition of claim 57 applied thereto.

60. (withdrawn) A low density, epoxy-based intumescent fire resistive coating having a density less than about 0.7 g/cm^3 .

61. (withdrawn) The coating of claim 60 wherein the coating has a density no greater than about 0.4 g/cm^3 .

62. (withdrawn) The coating of claim 60 or 61 wherein the coating is formed from a waterborne resin.

63. (withdrawn and currently amended) The coating of any of claims 60-62 wherein the coating includes the reaction product of a sulfonyl hydrazide blowing agent and a curing agent comprising a waterborne epoxy adduct of a polyamine, a polyamide or a polyamide-amine.

64. (withdrawn) The coating of any of claims 60-63 wherein the coating includes a char-forming polyol and a gas-forming agent.

65. (new) The method of claim 1, wherein the curing agent is a waterborne epoxy adduct of a polyamine.

66. (new) The method of claim 1, wherein the curing agent is a waterborne epoxy adduct of a polyamide.

67. (new) The method of claim 1, wherein the curing agent is a waterborne epoxy adduct of a polyamide-amine.

68. (new) The method of claim 1, wherein the curing agent is the waterborne reaction product of a polyalkylene oxide monoamine or diamine and a diepoxide or a polyepoxide, which is then reacted with a polyamine or polyamide. [¶ 0025, lines 17-19]

69. (new) The method of claim 1, wherein the curing agent is the waterborne reaction product of a polyalkylene oxide monoalcohol and a polyepoxide, which is then reacted with a polyamine or polyamide. [¶ 0025, lines 19-21]

70. (new) The method of claim 1, wherein the sulfonyl hydrazide chemical blowing agent is at least one of p-toluenesulfonylhydrazide, p,p'-oxybis(benzenesulfonyl-hydrazide), 2,4-toluenedisulfonylhydrazide, p-methylurethane benzene-sulfonylhydrazide, benzenesulfonylhydrazide, benzene-1,3-disulfonylhydrazide, diphenylsulfone-3,3'-disulfonylhydrazide, and sulfone hydrazide.